# Freeform Search

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IBM Technical Disclosure Bulletins

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**Display:** 10 **Documents in Display Format:** - **Starting with Number** 1

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## Search History

**DATE: Monday, March 28, 2005** Printable Copy Create Case

| Set Name side by side | Query | Hit Count | Set Name result set |
|---|---|---|---|
| *DB=USPT; PLUR=YES; OP=OR* | | | |
| L15 | 5005152.pn. | 1 | L15 |
| L14 | 5724575.pn. | 1 | L14 |
| *DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=OR* | | | |
| L13 | L12 and object with table with view | 46 | L13 |
| L12 | L11 and (metadata or meta with data) | 346 | L12 |
| L11 | L10 and relation$ near (database or data with base) | 952 | L11 |
| L10 | L9 and (object-oriented or object near oriented) near (database or data with base) | 1273 | L10 |
| L9 | 707.clas. | 25880 | L9 |
| L8 | 707/103r | 997 | L8 |
| L7 | 707/102 | 5523 | L7 |
| L6 | 707/100 | 5809 | L6 |
| L5 | 707/10 | 9557 | L5 |
| L4 | 707/4 | 3982 | L4 |
| L3 | 707/3 | 6815 | L3 |

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|---|---|---|---|
| L2 | 707/2 | 4290 | L2 |
| L1 | 707/1 | 6562 | L1 |

END OF SEARCH HISTORY

L13: Entry 41 of 46 File: USPT Dec 21, 1999

US-PAT-NO: 6006214
DOCUMENT-IDENTIFIER: US 6006214 A
**** See image for Certificate of Correction ****

TITLE: Database management system, method, and program for providing query rewrite transformations for nested set elimination in database views

DATE-ISSUED: December 21, 1999

INVENTOR-INFORMATION:

| NAME | CITY | STATE | ZIP CODE | COUNTRY |
|---|---|---|---|---|
| Carey; Michael J. | San Jose | CA | | |
| Kiernan; Gerald George | San Jose | CA | | |

ASSIGNEE-INFORMATION:

| NAME | CITY | STATE | ZIP CODE | COUNTRY | TYPE CODE |
|---|---|---|---|---|---|
| International Business Machines Corporation | Armonk | NY | | | 02 |

APPL-NO: 08/ 760059 [PALM]
DATE FILED: December 4, 1996

INT-CL: [06] G06 F 17/30

US-CL-ISSUED: 707/2; 707/103
US-CL-CURRENT: 707/2

FIELD-OF-SEARCH: 707/1-4, 707/100-103

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

Search Selected Search ALL Clear

| | PAT-NO | ISSUE-DATE | PATENTEE-NAME | US-CL |
|---|---|---|---|---|
| ☐ | 5659725 | August 1997 | Levy et al. | 707/1 |
| ☐ | 5713015 | January 1998 | Goel et al. | 707/4 |
| ☐ | 5724570 | March 1998 | Zeller et al. | 707/3 |
| ☐ | 5774692 | October 1995 | Boyer et al. | 395/500 |

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Kim, W., "Object-Oriented Database Systems: Promises, Reality, and Future", Proceedings of the 19.sup.th International Conference on Very Large Data Bases, Aug. 24-27, 1993, Dublin, Ireland; Agrawal, R. et al., Editors; pp. 676-687.
Carey, M.J. et al., A Data Model and Query Language for EXODUS', Proceedings SIGMOD International Conference on Management of Data, Chicago, Illinois, Jun. 1-3, 1988, ACM Press, SIGMOD Record, vol. 17, No. 3, Sep. 1988, pp. 413-423.
Kim, W., "A Model of Queries for Object-Oriented Databases", Proceedings of the Fifteenth International Conference on Very Large Data Bases, Aug. 22-25, 1989, Amsterdam. The Netherlands; Apers, P.M.G. et al., Editors; pp. 423-432.
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Orenstein, J. et al., "Query Processing in the ObjectStore Database System", Proceedings of the 1992 ACM SIGMOD International Conference on Management of Data, San Diego, California, Jun. 2-5, 1992, SIGMOD Record, vol. 21, Issue 2, Jun. 1992; Stonebraker, M., Editor; 1992 ACM, pp. 403-412.
Dar., S. et al., "CQL++:A SQL for the Ode Object-Oriented DBMS", Proceedings of the 3.sup.rd International Conference on Extending Database Technology, Advances in Database Technology--EDBT '92; Lecture Notes in Computer Science; Vienna, Austria, Mar. 1992, Pirotte, A. et al., Editors; 1992 Springer-Verlag Berlin Heidelberg, pp. 201-216.
Kifer, M. et al, "Querying Object-Oriented Databases", Proceeding of the 1992 SIGMOD International Conference on Management of Data, San Diego, California, Jun. 2-5, 1992, SIGMOD Record, vol. 21, Issue 2, Jun., 1992; Stonebraker, M., Editor; ACM Press, pp. 393-402.
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Blakeley, J.A. et al., "Experiences Building the Open OODB Query Optimizer", Proceedings of the 1993 ACM SIGMOD International Conference on Management of Data, SIGMOD '93, Washington, D.C., May 26-28, 1993; Buneman, P. et al., Editors; SIGMOD Record, vol. 22, Issue 2, Jun. 1993, ACM Press, pp. 287-296.
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Murnick, I.S. et al., "Magic is Relevant", Proceedings of the 1990 ACM SIGMOD International Conference on Management of Data, May 23-25, 1990, Atlantic City, New Jersey; Garcia-Molina, H. et al., Editors: 1990 ACM, pp. 247-258.
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IBM Corporation Itasca, Objectivity, Inc., Ontos, O2, Servio, SunSoft, Inc., Sybase, Inc., and Taligent, Inc.; Joint Submission, "Object Query Service Specification", OMG TC Document 95.1.1, Jan. 4, 1995.
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ISO Working Draft, "Database Language SQL-Part 2:Foundation (SQL/Foundation)", CD9075-2:199.chi.SQL, Sep. 11, 1997, ISO/IECJTC1/SC21N11106 - DBL:???-002, Table of Contents, Section 6.7 <field reference>, and Section 6.8 <monadic function reference>.
Kiernan, J. et al., "Extending SQL-92 for OODB Access: Design and Implementation Experience", Proceedings of the Conference on Object-Oriented Programming Systems '95, Austin, Texas, 1995 ACM, pp. 467-480.

ART-UNIT: 271

PRIMARY-EXAMINER: Black; Thomas G.

ASSISTANT-EXAMINER: Alam; Hosain T.

ATTY-AGENT-FIRM: Gates & Cooper

ABSTRACT:

The system, method, and program of this invention, referred to herein as nest elimination, performs query rewrite transformations, within a database management system (DBMS), for a certain class of object queries over views that involve derived nested sets. The nest elimination algorithm uses query rewriting to avoid computing these nested sets in certain common cases. For each quantifier in a query (if the quantifier is defined over a nested set that is a part of a view or if the quantifier is implemented by a subquery that projects a NEST aggregate) the following functions are performed: a) resetting an element to which a quantifier is bound in the database query to an argument of a nest aggregate function in a nest subquery of a view; b) adding a null testing predicate to the rewritten database query; c) adding quantifiers defined within the nest subquery to the rewritten database query; d) adding predicates from the nest subquery of the view to the rewritten database query; and e) rewriting each expression involving a quantifier over an instance into a path expression. The resulting rewritten query is then further processed by the DBMS such as through a query optimizer, etc. By avoiding nested set computations for a certain class of queries, the rewritten query can result in improved processing performance.

25 Claims, 5 Drawing figures

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L13: Entry 41 of 46 File: USPT Dec 21, 1999

DOCUMENT-IDENTIFIER: US 6006214 A

** See image for Certificate of Correction **

TITLE: Database management system, method, and program for providing query rewrite transformations for nested set elimination in database views

Brief Summary Text (6):

Databases are computerized information storage and retrieval systems. A relational database management system (RDBMS) is a database management system (DBMS) which uses relational techniques for storing and retrieving data. Relational databases are organized into tables which consist of rows and columns of data. The rows are formally called tuples. A database will typically have many tables and each table will typically have multiple tuples and multiple columns. The tables are typically stored on random access storage devices (DASD) such as magnetic or optical disk drives for semi-permanent storage.

Brief Summary Text (8):

In object-oriented databases (OODB), the database is organized into objects having members that can be pointers to other objects. An object can have parent-child hierarchical relationships. The objects contain references, and collections of references, to other objects in the database, thus leading to databases with complex nested structures.

Brief Summary Text (9):

The integration of object technology and database systems has been an active area of research for the past decade. One important aspect of the integration of these two technologies is the provision of efficient, declarative query interfaces for accessing and manipulating object data. Compared to other aspects of object-oriented database (OODB) technology, such as integrating persistence into object-oriented languages like C++ and Smalltalk, queries were given relatively little attention in the early days of OODB research. See "Third Generation Data Base System Manifesto, Mike Stonebraker, Computer Standards & Interfaces, 12, December 1991. In "Object-Oriented Database Systems: Promise, Reality, and Future," Won Kim, Proc. 19th International Conference on Very Large Data Bases, Dublin, August 1993, it is pointed out that even today, a number of commercial OODB systems are quite weak in this regard. As the OODB field has developed, however, a number of proposals for OODB query languages have appeared in the database literature including the following:

Brief Summary Text (11):

"A Model of Queries for Object-Oriented Databases," Kim, Won; Proc. 15th International Conference on Very Large Data Basses, Amsterdam, August 1989.

Brief Summary Text (12):

"A Query Language for the O.sub.2 Object-Oriented Database System," Bancilhon, Francois; Cluet, S.; Delobel, C.; Proc. 2nd International Workshop on Database Programming Languages, Hull, Richard; Morrison, Ron; Stemple, David, editors; Gleneden Beach, June 1989, Morgan-Kaufmann Publishers, Inc.

Brief Summary Text (15):

"Querying Object-Oriented Databases," Kifer, Michael; Kim, Won; Sagiv, Yehoshua;

Proc. ACM-SIGMOD International Conference on Management of Data, San Diego, June 1992.

Brief Summary Text (18):
While proposals outnumber actual implementations, several of these language designs have indeed been implemented as the query interfaces for significant commercial OODB products. See, "A Query Language for the O.sub.2 Object-Oriented Database System," Bancilhon, Francois; Cluet, S.; Delobel, C.; Proc. 2nd International Workshop on Database Programming Languages, Hull, Richard; Morrison, Ron; Stemple, David, editors; Gleneden Beach, June 1989, Morgan-Kaufmann Publishers, Inc. See also, "Query Processing in the ObjectStore Database System," Orenstein, Jack; Haradhvala, Sam; Margulies, Benson; Sakahara, Don; Proc. ACM-SIGMOD International Conference on Management of Data, San Diego, June 1992.

Brief Summary Text (20):
Furthermore, it should be noted that SQL has object relational queries, and Illustra Relational Database System has object oriented features in it.

Brief Summary Text (22):
A query can declaratively specify the contents of a view. For relational databases, a view is essentially a virtual table having virtual rows and virtual columns of data. Although views are not directly mapped to real data in storage, views can be used for retrieval as if the data they represent is actually stored. A view can be used to present to a user a single logical view of information that is actually spread across multiple tables.

Brief Summary Text (27):
The invention presented herein is in the framework of an OMG compliant (See "OMG. Object Services Request for Proposals," OMG TC Document 94.4.18, 1994; and "OMG. Object Query Service Specification, Joint Submission," OMG TC Document 95.1.1, 1995) Object Query Service which is based upon SQL queries and other technology for handling the requirements of object technology. Although the preferred embodiment is described in relation to an object oriented database system, the invention is applicable to other database systems including relational and hierarchical database systems.

Detailed Description Text (2):
An explanation of some of the terminology used herein is provided below. Although the following definitions are described using terminology applicable to relational databases (e.g., tables, columns, rows, attributes) the terminology is applicable to other systems (e.g., object-oriented or hierarchical systems and databases) by substituting the appropriate corresponding entity. For example, the terms "table," "view (either an OO view or relational view)", object, or a queryable collection of objects can all be used interchangeably herein. Likewise, the term "row" in a relational model could be equated with an object that is within a collection of objects in an object model. Likewise, the term "attribute" in a relational model could be equated with a member function or data member in an object model. The word "entity" or "element" is used generically in the context of both relational and object-oriented systems. It should be noted that because the models are different, there is not necessarily an exact correlation between the two. Likewise there are many different object models so the correlation between relational and object models must be quite flexible and should be loosely defined.

Detailed Description Text (6):
View: A view is an example of a virtual table (or a virtual collection of queryable objects). That is, it is generally not physically materialized anywhere until it is needed, such as when an SQL statement references it, for example. The metadata about the view (including the name of the view, the names and data types of each column and the way in which the rows are to be derived) is stored persistently in the database's metadata, but the actual data that a user can see in the view are

not physically stored anywhere in association with the derived table. Rather, the data are stored in base tables (persistent base tables in SQL) from which the view's rows are derived.

Detailed Description Text (10):
The preferred embodiment of this invention is incorporated into OOSQL, an Object-Oriented Query Service which provides SQL based query access to C++ programming language environments, Object-Oriented Systems (OOSs) (such as VAC++, SOM, and SOM 400) and Object-Oriented Database Systems (OODBs). In contrast to the ObjectStore, O2, and ODMG-93 query interfaces, the present invention is embodied in an OODB query interface that provides an upward compatible extension to SQL-92 (ISO.sub.--ANSI. Database Language SQL ISO/IEC 9075:1992, 1991). This enables programmers familiar with SQL to write OODB queries without learning an entirely new language. They simply learn about the object extensions. Also, this enables the many tools that have been built for relational systems to access OODB data via interfaces such as ODBC. (Microsoft. Programmer's Reference, Microsoft Open Database Connectivity Software Development Kit, 1992.)

Detailed Description Text (11):
In relational database management systems (DBMSs) using the SQL-92 query language, columns are of simple atomic types, and columns appear in queries as c or q.c where c is a column of some table and q is a correlation name (i.e., a range variable) defined over a table. In query languages for Object-Oriented DBMSs, column expressions are replaced with path expressions that allow traversal through pointers, embedded classes, structs, multi-valued collections, and relationships to reach nested data members. The SQL3 draft (See Understanding the New SQL: A Complete Guide; Jim Melton and Alan R. Simon; Morgan-Kaufmann Publishers, Inc., 1993; See also, ISO-ANSI Working Draft: Database Language SQL (SQL3), Jim Melton, editor; ISO/IEC SC21 WG3 DBL YOW-004 and ANSI X#H2-94-084. ISO.sub.-- ANSI, 1995) proposes traversal through embedded Abstract Data Types (ADT). The ".." characters are used to express traversal through embedded types. For example, if address is an ADT of type Address, then e.address..zip expresses the traversal through the Address structure to obtain the data member zip.

Current US Class (1):
707

Other Reference Publication (3):
Kim, W., "Object-Oriented Database Systems: Promises, Reality, and Future", Proceedings of the 19.sup.th International Conference on Very Large Data Bases, Aug. 24-27, 1993, Dublin, Ireland; Agrawal, R. et al., Editors; pp. 676-687.

Other Reference Publication (5):
Kim, W., "A Model of Queries for Object-Oriented Databases", Proceedings of the Fifteenth International Conference on Very Large Data Bases, Aug. 22-25, 1989, Amsterdam. The Netherlands; Apers, P.M.G. et al., Editors; pp. 423-432.

Other Reference Publication (6):
Bancilhon, F. et al., "A Query Language for the O.sub.2 Object-Oriented Database System", Proceedings of the 2.sup.nd International Workshop on Database Programming Languages, Gleneden Beach, Oregon, 1989; Hull, R. et al., Editors; 1990 Morgan Kaufmann Publishers, Inc., pp. 122-138.

Other Reference Publication (9):
Kifer, M. et al, "Querying Object-Oriented Databases", Proceeding of the 1992 SIGMOD International Conference on Management of Data, San Diego, California, Jun. 2-5, 1992, SIGMOD Record, vol. 21, Issue 2, Jun., 1992; Stonebraker, M., Editor; ACM Press, pp. 393-402.

Other Reference Publication (12):

Kim., W., "Observations on the ODMG-93 Proposal for an Object-Oriented Database Language", SIGMOD Record, vol. 23, No. 1, Mar. 1994.

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L13: Entry 45 of 46 File: USPT Mar 31, 1998

US-PAT-NO: 5734887
DOCUMENT-IDENTIFIER: US 5734887 A

TITLE: Method and apparatus for logical data access to a physical relational database

DATE-ISSUED: March 31, 1998

INVENTOR-INFORMATION:

| NAME | CITY | STATE | ZIP CODE | COUNTRY |
|---|---|---|---|---|
| Kingberg; Denis G. | Raleigh | NC | | |
| McCubbin; Ellen Margaret | Cary | NC | | |
| Martin; William John | Apex | NC | | |

ASSIGNEE-INFORMATION:

| NAME | CITY | STATE | ZIP CODE | COUNTRY | TYPE CODE |
|---|---|---|---|---|---|
| International Business Machines Corporation | Armonk | NY | | | 02 |

APPL-NO: 08/ 536737 [PALM]
DATE FILED: September 29, 1995

INT-CL: [06] G06 F 17/30

US-CL-ISSUED: 395/604; 395/611
US-CL-CURRENT: 707/4; 707/100

FIELD-OF-SEARCH: 395/604, 395/611

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

Search Selected Search ALL Clear

| | PAT-NO | ISSUE-DATE | PATENTEE-NAME | US-CL |
|---|---|---|---|---|
| ☐ | 5206951 | April 1993 | Khoyi et al. | 395/650 |
| ☐ | 5261080 | November 1993 | Khoyi et al. | 395/500 |
| ☐ | 5295222 | March 1994 | Wadhwa et al. | 395/1 |
| ☐ | 5303379 | April 1994 | Khoyi et al. | 395/700 |
| ☐ | 5307484 | April 1994 | Baker et al. | 395/600 |

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Casey, Logical Data Interface, IBM TDB, vol. 16, No. 4, Sep. 1973 pp. 1203-1207.
Meltzer, Terminology and an Architecture on Data Independence, IBM TDB, vol. 14, No. 12, May 1972, pp. 3709-3712.
IBM TDB, vol. 29, No. 7, Dec. 1986, pp. 2894-2900, Larner, "Access Independent Query Definition in IBM DL/I".
IBM TDB, vol. 26, No. 5, Oct. 1983, pp. 2557-2559, Pullin et al, "Method for Accessing Hierarchical Views of a Binary Relational Database".
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Computer, Jan. 1986, pp. 63-73, Keller, "The Role of Semantics in Translating View Updates", Jan. 1986.
Article by P. Palvia, Memphis State University, Nat'l. Computer Conf.1987, pp. 573-582, "How sensitive is the physical database design? Results . . . ".
Byte, Apr. 1989, pp. 221-233, Orr et al, "Methodology: The Experts Speak".
ACM Trans. on Office Info. Systems, vol. 5, No. 1, Jan. 1987, pp. 48-69, Fishman et al. "Iris: An Object-Oriented Database Management System".
Computer, Dec. 1991, pp. 55-62, Collet et al, "Resource Integration Using a Large Knowledge Base in Carnot".
Dr. Dobb's Journal, Nov. 1994, pp. 36-40 & cont'd. "Database Management in C++".

ART-UNIT: 237

PRIMARY-EXAMINER: Black; Thomas G.

ASSISTANT-EXAMINER: Lintz; Paul K.

ATTY-AGENT-FIRM: Flynn; John D.

ABSTRACT:

Logical Data Access to the physical structure of a relational database is provided for one or more Applications. Applications are developed using the logical entity types and logical entity type attribute names as described in a logical data model. The Applications then use a Logical Data Access Interface to access each of the required physical relational database tables via the Logical Data Access Layer. Applications then use logical entity type and logical entity type attribute names as specified in the Logical Data Model in making Logical Data Requests to the Logical Data Access Layer. The Logical Data Access Layer provides a rich set of functions for allowing an Application to control and manage a database, build and execute database queries and interface with physical database. The Logical Data Access Layer determines which of the physical tables and associated columns are required to satisfy the Application request and then builds one or more database query statements containing the appropriate physical table and column names.

16 Claims, 40 Drawing figures

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L13: Entry 46 of 46 File: USPT Oct 28, 1997

US-PAT-NO: 5682535
DOCUMENT-IDENTIFIER: US 5682535 A
**** See image for Certificate of Correction ****

TITLE: Operating system and data base using table access method with dynamic binding

DATE-ISSUED: October 28, 1997

INVENTOR-INFORMATION:

| NAME | CITY | STATE | ZIP CODE | COUNTRY |
|---|---|---|---|---|
| Knudsen; Helge | Oakville | | | CA |

ASSIGNEE-INFORMATION:

| NAME | CITY | STATE | ZIP CODE | COUNTRY | TYPE CODE |
|---|---|---|---|---|---|
| Amdahl Corporation | Sunnyvale | CA | | | 02 |

APPL-NO: 08/ 784736 [PALM]
DATE FILED: January 13, 1997

PARENT-CASE:
This is a continuation of application Ser. No. 08/097,096 filed Jul. 26, 1993 now abandoned.

INT-CL: [06] G06 F 9/44, G06 F 17/30

US-CL-ISSUED: 395/701; 395/702, 395/601, 395/610, 395/614, 395/50, 395/54
US-CL-CURRENT: 717/117; 707/1, 707/10, 717/109

FIELD-OF-SEARCH: 395/614, 395/701, 395/702, 395/601, 395/610, 395/50, 395/54

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

Search Selected Search ALL Clear

| | PAT-NO | ISSUE-DATE | PATENTEE-NAME | US-CL |
|---|---|---|---|---|
| ☐ | 4674032 | June 1987 | Michaelson | 364/200 |
| ☐ | 4774661 | September 1988 | Kumpati | 364/300 |
| ☐ | 4791561 | December 1988 | Huber | 364/300 |
| ☐ | 4860204 | August 1989 | Gendron et al. | 364/300 |

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|---|---|---|---|---|
| ☐ | 4905138 | February 1990 | Bourne | 364/200 |
| ☐ | 4918593 | April 1990 | Huber | 364/200 |
| ☐ | 4931928 | June 1990 | Greenfeld | 364/300 |
| ☐ | 4941102 | July 1990 | Darnell et al. | 364/513 |
| ☐ | 4971561 | November 1990 | Huber | 364/300 |
| ☐ | 4989132 | January 1991 | Mellender et al. | 364/200 |
| ☐ | 5005152 | April 1991 | Knutsen | 364/900 |

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D.J. Haderle et al., "IBM Database 2 Overview", IBM Systems Journal, vol. 23, No. 2, 1984, pp. 112-125.

ART-UNIT: 236

PRIMARY-EXAMINER: Kriess; Kevin A.

ASSISTANT-EXAMINER: Chaki; Kakali

ATTY-AGENT-FIRM: Fliesler, Dubb, Meyer & Lovejoy

ABSTRACT:

A system for program development and execution consisting of a high level programming language based on a four part rule organization, consisting of a rule definition, a list of conditions, a list of actions which are taken upon

satisfaction of a corresponding condition, and a list of exception handlers. The high level language is translated into an internal representation which controls a virtual stack machine. The virtual stack machine performs dynamic binding of rules and data to the current rule. Data access events are supplied through a table access method which provides an interface to the variety of sources of data coupled to the system. These sources of data include screens, import/export mechanisms, a foreign database system, such as IMS, and a local database system known as the table data store. The table data store organizes data in an object oriented, relational system, where each table is ordered on a primary key. Also, the table access method performs selection and ordering operations on the tables accessible through the table access method, implements and triggers invalidation routines upon data access events, in a recursive relationship with the virtual stack machine, and provides a common view of data stored across the heterogeneous data stores coupled through servers to the table access method. The ordered tables are subdividable by additional parameters associated with table names.

18 Claims, 40 Drawing figures

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